Spyder: Critical Technology Demonstration Tests

Completed Technology Project (2017 - 2020)

Project Introduction

Two technology demonstrations: Task 1 – Sub-orbital hot fire staging with guidance and control utilizing NASA-Ames AVA. Task 2 – Spyder stage 1 static test, nose fairing separation test, lightweight staging system test. 18 month program to complete all tests for Task 1 and 2. Major milestones include Systems Requirements Review (SRR), PDR, CDR, Sub-orbital ACS demonstration. A dedicated 6U CubeSat launch vehicle for NASA and commercial to Low Earth Orbits. ~ $1M total launch services target price. NASA Payloads: On-ramp Spyder through current NASA Flight Opportunities Program (FOP) IDIQ2 contract to support directed NASA orbital payload requirements. Provide launch services to other US Government entities. UP Aerospace will commercially market Spyder launch and payload integration services worldwide. The design concept is scalable to larger payload lifting capability vehicles to meet market demands.

Anticipated Benefits

UP Aerospace will commercially market Spyder launch and payload integration services worldwide. The design concept is scalable to larger payload lifting capability vehicles to meet market demands. These solicitations increase focus on collaborations with the commercial space sector that not only leverage emerging markets and capabilities to meet NASA's strategic goals, but also focus on industry needs. NASA's investments in industry partnerships can accelerate the availability of, and reduce costs for the development and infusion of, these emerging space system capabilities. While developing the technology to enable NASA's next generation of science and human exploration missions, we will grow the economy and strengthen the nation's economic competitiveness.

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

UP Aerospace, Inc

Responsible Program:

Flight Opportunities

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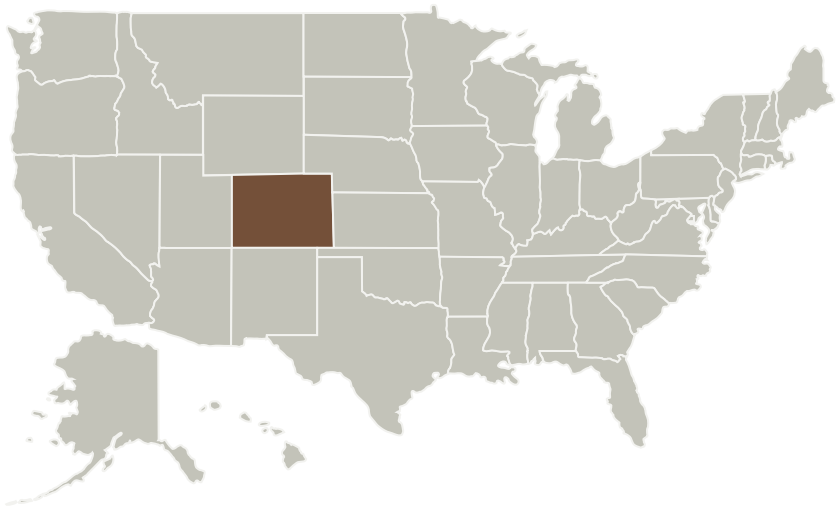
Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
UP Aerospace, Inc	Lead Organization	Industry	Highlands Ranch, Colorado

Primary U.S. Work Locations
Colorado

Project Transitions

June 2017: Project Start

Project Management

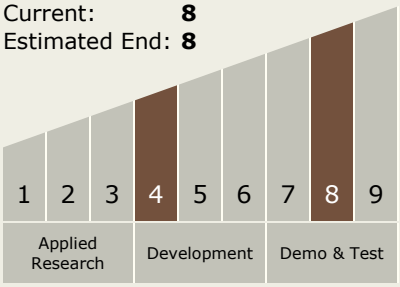
Program Director:
Christopher E Baker

Program Manager:
John W Kelly

Principal Investigator:
Jerry Larson

Technology Maturity (TRL)

Start: **4**
Current: **8**
Estimated End: **8**



Target Destination

Earth

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September 2020: Closed out

Closeout Summary: A suborbital mission will demonstrate several subsystems for a launch vehicle currently under development. The subsystems include a Guidance, Navigation & Control (GN&C) system, nose-fairing separation system, and light weight staging system. The goal is a launch vehicle capable of launching small nanosatellites to LEO. Delays were encountered because of the COVID pandemic. The 2nd, 3rd, and 4th stage motor qualification was completed successfully during the spring of 2020. Stage 1 casting and static testing is expected to take place in the spring of 2022.

Project Website:

https://www.nasa.gov/directorates/spacetech/home/index.html